DREW XP DENSITY METER

DESCRIPTION

The DREW XP DENSITY METER is used for onboard testing and analysis to accurately determine the density of fuel and lube oils. The self-contained test kit includes a thermostatically controlled heating unit, a series of hydrometers, cleaning rod, spare fuses, power cable, and an easy-to-use manual. Test results are available in minutes.

Density is one of the most important characteristics of fuel oil quality. With marine fuel prices at record highs, the most immediate value of accurate density measurements provided by the DREW XP DENSITY METER is confirming at bunkering the amount of fuel delivered, as well as verifying lube oil density on delivery against the label. Density measurements at bunkering or while underway provide essential information about the ability of fuel oil to shed water, sediment and catalyst fines while settling in storage, or during centrifuging. And fuel oil density in combination with fuel oil viscosity is used to calculate the ignition quality of fuel oil.

DREW XP DENSITY METER
(PCN 1AB2755)

FUEL OIL DENSITY

Density is defined for these purposes as the mass of a fuel or lube oil divided by its volume at an observed temperature. Because density changes with temperature, density should always be stated in terms of the specific units of measurement used and the temperature at which it was determined or converted. Timely access to accurate density values for fuel oil contributes to:

- **Obtaining full monetary value from purchased bunkers**

Fuel oil is purchased and paid for by weight (e.g., metric tons), but measured and documented on delivery by volume (e.g., cubic meters, barrels, gallons, etc.) Applying accurate density values to the volume delivered is essential to determining the true monetary value of the purchased fuel. Discrepancies in density can have an enormous impact on value versus outlay. For example, a density difference of 10 kg/m3 is equal to 10 metric tons for every 1000 m3 volume of fuel oil measured.

Density values measured by onboard testing can help protect against misrepresentations by unscrupulous operators, as well as routine documentation errors. In all cases, density testing that shows significant differences versus the bunker delivery note should trigger submittal of samples to an accredited shore-based laboratory for confirmation and bunker claim processing, if warranted.

- **Maximizing operating and combustion efficiency**
  - Accurate measurement of density is necessary to properly adjust purifier operation for removing water, sediment and catalyst fines.
  - The Calculated Carbon Aromaticity Index (CCAI) of fuel oil, determined by combining density and viscosity values, provides an indication of fuel ignition quality and combustion delay. In turn, CCAI values exceeding manufacturer-specified ranges can signal the need for application of a combustion improver (e.g., Drew Marine's AMERGIZE, a combustion improver-type additive (PCN 0098401), or other corrective measures as appropriate.
  - Density is a key component in estimating the energy content of fuel for use in fuel-to-power conversion efficiency programs. (Note: this value is typically calculated and reported by shore-based laboratory testing.)

- **Lube Oil Density**

Changes in lube oil density typically point to problems such as the presence of water or particulate contaminants, additive depletion, or oxidation. Onboard testing to measure lube oil density provides best value for:

- Confirming product received versus stated product density.
- Establishing the density of new lube oils as benchmarks.
- Monitoring lube oil condition both at scheduled intervals and to investigate symptoms of possible degradation or other problems.
- Whenever testing shows significant differences between lube oil density and reference values, the used lube oil sample should be forwarded to an accredited shore-based laboratory for density confirmation and guidance regarding corrective measures.

Contact your Drew Marine representative for more information

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TECHNICAL FEATURES – DREW XP DENSITY METER

- The broad measurement range of 800.0 to 1010.0 kg/m3 at 15°C facilitates analysis of a variety of fuel grades and selection of appropriate hydrometers for more precise measurement of density.
- Options for measuring density at 50° C or 70° C correspond to standard parameters used for shore-based testing for maximum utility.
- The calibrated hydrometers included with the test kit allow operators onboard to precisely determine density in vacuo at 15°C, replicating the capabilities of shore-based laboratories.

OPERATING BENEFITS

- Accuracy to laboratory standards
- Simple, step-by-step testing procedures
- Results provided in 20 minutes or less
- A design innovation allows the heating element for the sample also to serve as its handled container — no need to transfer sample to other cylinders for processing. The container holds enough sample for preparation and use in other tests.

CLEANUP

The use of harsh chemicals for cleaning test kit instruments and accessories is not advisable. Use only approved cleaning agents (e.g. Drew Marine's TEST KIT CLEANER (PCN1AB2738) to clean test kit components and wipe clean using a clean rag. Dispose of the used rag as used oil.

TEST PROCEDURES

Refer to the Density section of the DREW XP FUEL & LUBE OIL TEST CABINET Operating Manual for step-by-step operating procedures and precautions.

CONTENTS AND ORDERING INFORMATION

This test is standard as part of the DREW XP FUEL & LUBE OIL TEST CABINET (PCN # 1AB2757).

Reorders	
Description	PCN
DREW XP DENSITY METER	1AB2755

Spares and Replacements	
Description	PCN
Density Meter Unit	On Request
Power Cable, 2M, EU	1AB2800
Test Cleaning Rod	1AB2736
Test Fuse Kit	1AB2737
DREW XP-DEN Hydrometer BR 0.80-1.01	1AB2744
DREW XP-DEN Hydrometer HR 0.85-0.95	1AB2745
DREW XP-DEN Hydrometer LR 0.90-1.01	1AB2746

Contact your Drew Marine representative for more information

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